

Graceon B Gordon. How Public Librarians Perceive Makerspaces Impacting Youth Development. A Master's Paper Proposal for the M.S. in L.S degree. July, 2020. 36 pages. Advisor: Brian Sturm

Makerspaces have been a topic of interest for libraries as of late, and research has described how library makerspaces are able to impact their designated communities. However, many libraries themselves that have or want a makerspace do not explicitly state or even know the benefits makerspaces have on youth. The purpose of this study is to fill the knowledge gap between teen development and the impact makerspaces have on those developmental assets by stating how research defines and connects the two areas. In particular, this study will look at the perceptions and experiences of public librarians that work with teens and makerspaces.

Headings:

Public Libraries

Library services for teenagers

Public Librarians

Library use studies

HOW PUBLIC LIBRARIANS PERCEIVE MAKERSPACES IMPACTING YOUTH  
DEVELOPMENT

by

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## Introduction

There are various areas of development that have been seen in adolescents, and the ages between children and adults is a very important time of self-identification for many in that age range (Scales, et. al., 2006, p. 695). Public libraries offer these young adults safe places to foster these assets, but one of the newest of these spaces/services is makerspaces. It is generally thought that public libraries need to have technologies simply to give access to those who do not have it. While that is a very real aspect of a public library, there are services such as makerspaces that can provide so much more in addition to that. Many resources talk about makerspaces, but none that have been able to bridge the knowledge gap between what development assets teens have and how makerspaces specifically foster different attitudes, behaviors, and understandings connected to developmental assets. Additionally, it can be very difficult to advocate for these types of spaces when there are no studies that draw together theoretical concepts through literature and practical concepts through experience. Libraries are under constant pressure from their stakeholders to provide services that will not only provide essential services to their communities but also provide services that can enrich. This study will provide analysis that librarians can refer to in order to aid in convincing their stakeholders of the benefits makerspaces have in addition to spreading awareness about what makerspaces can do for their library communities. This project will accomplish this

by providing and connecting literature in the aforementioned fields and by getting the perceptions of librarians working with teens and makerspaces on these topics.

## Research Questions and Key Terms

This phenomenological study will allow for an in-depth analysis of the theoretical concepts and practical applications for youth development in makerspaces through the understanding of literature and librarians. This perspective from librarians will show how makerspaces are being used by teens and will connect developmental assets that teens exhibit with those uses of the space.

The main research question answered through this study is: How do librarians perceive makerspaces impact youth development? Subsequent questions that will be answered in the literature review include the following: What are makerspaces?, What is youth development?, What is the overlap between makerspaces and youth development?, and What do librarians think about these subjects?

To properly answer these questions, there are a few terms that will be used to narrow down the scope of the project:

- Development assets – As specified through analysis in the literature review.
- Teen development – Development assets of adolescents between ages 12-18.
- Makerspace – A specific, collaborative space libraries have for making/creating/developing concepts/projects with designated technologies to assist in that.
- Makerspace librarian– Librarians who run their library's makerspace and work with teens.

- Teen services librarian– Librarians who specialize in teen services and work in their library's makerspace.

## Literature Review

Literature has provided the base work that describes the topics within libraries, makerspaces, and youth development. There are many definitions of what is counted as a makerspace, but this section will serve as a collection of works to narrow down a definition for the purposes of this project. It will then take a deeper look at different types of makerspaces, more specifically where they are located. It will specify what makes a public library makerspace and how it provides services specifically for the surrounding community. As a purpose of the public library makerspace is to aid in development, youth development has become a very important topic for makerspaces. The literature review will go into youth development in regards to the various models being used, and select a set of developmental assets that will guide this study. Finally, the two topics of makerspaces and youth development will be drawn together by expanding on how the technology in makerspaces aids in youth development concerning the selected developmental assets mentioned in the previous section.

### Makerspaces

There are many definitions of makerspaces, and each definition could allow for a different space. Ina Fourie and Anika Meyer state that makerspaces have technologies and are spaces that “are associated with creating, building and crafting and getting hands-on experience in activities ranging from woodworking, sewing and building computers to audio-recordings and video editing.” (2015, p. 519). In “Making culture: a national study



of education makerspaces,” the authors define makerspaces as “communities where participants design and produce creations using a variety of tools and crafts. These spaces often combine both technical and artisanal approaches, fostering a sense of agency, engagement, ingenuity and problem-solving.” (Kim, et. al., 2019, p. 1).

Makerspaces could also be “informal sites for creative production in art, science, and engineering where people of all ages blend digital and physical technologies to explore ideas, learn technical skills, and create new products.” (Sheridan, et. al., 2014, p. 505). Each of these could include a physical or a virtual space, a stationary or mobile space, and could be targeted towards anyone. Some makerspaces are there specifically to bring things to the people by going mobile (Moorefield-Lang, 2015), while others use their stationary makerspaces to give their patrons a place to come to their library and know it is a safe place that will accept all backgrounds and perspectives (Halverson, Lakind, & Willett, 2017, p. 60). However, makerspaces have been instrumental in the shift toward viewing library users as “makers” rather than only “consumers,” and people need to understand these ideas (Peppler & Bender, 2013, p. 23).

### Public Library Makerspaces

Public libraries have been one of the most important advocates for these spaces for their patrons. Many people have thought of them as simple DIY stations (Willett, 2016, p. 314) (Fourie & Meyer, 2015). However, they have become essential parts of communities for various reasons including, but not limited to, “[generating] interest in diverse educational realms” (Sheridan, et. al., 2014, p. 506), “facilitation of community partnerships” (Halverson, Lakind, & Willett, 2017, p. 58), and can provide to underserved communities in ways other institutions cannot (Feist, 2018).

## Youth Development

It is not always very apparent what developmental assets are, but some incredible models identify what is needed for positive development from adolescents. Many people do not even know that these models are outlined and available. Developmental Assets Profile (DAP) from the Search Institute details 40 developmental assets in eight categories “that help young people grow up healthy, caring, and responsible.” (Search Institute, 1997). These eight categories include four sections within external assets – support, empowerment, boundaries & expectations, and constructive use of time – and four sections within internal assets – commitment to learning, positive values, social competencies, and positive identity (Search Institute, 1997). Not only does this development framework provide a basis for other institutions to adapt and build on, but it has been shown to “be translated and effectively administered in a variety of cultural settings globally, involving diverse youth, including youth who are out-of-school, have relatively lower literacy levels, or are living in post-conflict zones.” (Scales, 2011, p. 642). It can be adapted to help those who are especially in need and because of their young age makes them very resilient and responsive to the change: “As noted, rather than detracting from the services offered to students considered at risk, the framework encourages engagement and collaboration among the various systems involved in students’ lives and has potential to expand school social work practice.” (Edwards, et. al., 2007, p. 152). These developmental assets are shown to be very highly related to academic achievement, where the students with greater developmental assets showed “significantly higher GPAs...than students whose assets levels decreased.” (Scales, et. al., 2006, p. 691). If these developmental asset frameworks are so incredible, it is baffling

as to why many people do not know they exist. There is a recognition of some knowledge gap between the theoretical concept of the frameworks and how to apply and encourage these assets in real-life situations. Scales, et. al. even notice that sometimes there is missing research on the theoretical concepts and measuring of developmental assets that present themselves (2000, p. 44). Wohlwend and Peppler wrote to fight against schools increasing school time and decreasing play time by expressing the need for children to be able to develop other essential developmental skills that they learn from non-academic activities (2015). A study about adding technologies to a library to close a gap between middle- and lower-income families published by Neuman and Celano had fascinating conclusions:

“Therefore, far from leveling the playing field, technology and the renovations that supported it seemed to further substantiate the differences between groups. Closing the ‘digital divide’ (Negroponte, 1996) appeared to widen the ‘learning divide.’ And, given the potential of this digital medium—its ready access to information, its speed of information flow— this divide may be very difficult to close.” (2006, p. 197).

The question remaining is, what if the technologies provided by the libraries are simultaneously providing access and being offered in ways that help close this “learning divide”?

## Youth Development in Library Makerspaces

This is precisely the gap that makerspaces can fill. While some libraries implement technologies just to provide access but do not teach their patrons how they can and should interact with them, makerspaces are spaces that libraries can use to assist in eliminating this issue. Additionally, makerspaces better equip the patrons/target community with developmental assets as well as those in charge of the makerspaces to

further their interests and share them with their community (Stevenson, et. al., 2019). They help “those with power see beyond their own worlds and into youth worlds” (Barton, Tan, & Greenberg, 2017, p. 39). This idea is very present in a study on youth taking part in making products in addition to making spaces as Barton, Tan, and Shin explain how the integration of the makerspaces was certainly important to youth development, but even more so how the space provided a way for them to develop their community, relationships, and other communicative skills (2016, p. 297). Makerspaces have been seen to increase youth’s motivation, engagement, feelings, emotions, confidence, and identity among many other key assets from the Search Institute’s developmental framework (Gomez, 2019, p. 7-13). They give adolescents the space to have conflicts and learn how to resolve them, and an understanding of how the environment they are in is helping them learn just as much as, if not even more than, working with the technologies (Barton, Tan, & Greenberg, 2017, p. 38-39).

It might be thought that makerspaces could simply be put into schools to do all of these things, but public libraries truly offer a different experience. School makerspaces do provide wonderful opportunities, but they are not often available for youth outside of their classes. Adolescents need a place they can go to after school hours in a non-academic environment, and as a participant in a study that looked at what youth had to say about makerspaces said, “makerspaces allowed participants to ‘do 10 times more than what they allow in an actual school class’ (Adam, PLM)” (Li & Todd, 2019, p. 322). A particularly wonderful quote from the same article states,

“Nathan (PLM): ‘Well for school it’s boring, it’s a forced thing, you are learning about the stuff that you don’t want to learn about sometimes.... School is a lot more pressure, you have to get grades, you have tests, you have to study..., but makerspace is a place where the knowledge you get is all on you, you decide

whether to use or not, and it's something you want to learn yourself, instead of being forced to do something.'” (Li & Todd, 2019, p. 323).

Public libraries are not necessarily governed by the rules and regulations of school districts and can be more adaptive towards their patron needs (Pisarski, 2014, p. 14). By offering makerspace services, public libraries can provide an incredible amount of support that is much needed for their youth. In addition to supporting nearly every single internal and external developmental asset as defined by the Search Institute, makerspaces are also places that prepare adolescents' future career paths through technological development. Public libraries are placed very well in their communities so that they can best advocate for everyone, and because public libraries are for the public, meaning anyone who walks through their doors, they have special abilities to reach those in minorities. Makerspaces can help girls get into more computing programs (Grover & Pea, 2013, p. 41), help level the opportunities for those with emotional or behavioral disorders (Gomez, 2019), and simply teach teens about things that they are not taught in schools such as how to apply for a job online or how to work in a team environment (Du, 2019, p. 159-160). Public library makerspaces can provide spaces for young adults to foster their developmental assets, library employees to increase their knowledge and experience, and the overall community to benefit from the understanding, skills, and behaviors learned from participating in the makerspace environment.

## Methodology

### Role of the researcher & positionality

My role as the primary researcher will be to oversee the completion of this study including recruiting and interviewing participants, transcribing and analyzing results, and presenting the results in connection to what is found in literature research.

As an employee in a public library and possible future employee in this specific career field, I am personally involved and interested to see how the results of this study can further improve the understanding of these subjects within the context of libraries. Additionally, with my career interest in this field, I will be reaching out to librarians I personally know in addition to those I do not but would be passionate about holding a similar position in the future. This positionality may impact the way in which I find and reach out to public libraries/librarians, as some of the participants may be people I know personally or know of by the suggestion of coworkers. Additionally, the ideas gathered from data collection might be biased by my previous knowledge of and experience in the subject area.

### Sampling

The population studied in this project are librarians that run their library's makerspace and work with teens in addition to teen librarians that work in makerspaces. The sampling unit from the population will be narrowed by 4 main criteria. The first is

that the libraries have to be within the United States. The second is that those being interviewed must work in a public library. The third is that the public library must have a makerspace, and the fourth is that the librarian must either be a makerspace librarian that works with teens or a teen services librarian that works in a makerspace. The main strategy in which the group will be selected is through convenience sampling, where searches will be conducted to find libraries that fit the specified criteria, after which librarians will be contacted that also fit the criteria.

### Data Collection

The type of data collection that will be used in this study is interviewing. After doing the initial selection of the sample, if the librarians agree to interviews, consent forms will be sent and signed before the interviews are conducted. The sample size is 10 contacted librarians and 5 selected for interviews. The process of searching, identifying, and conducting data collection will take approximately two months.

Interview methodology will allow for detailed results that would reveal more information than through other methods. Open-ended questioning provides the participants with the ability to express their own experiences in their language (Schultze & Avital, 2011). However, the interview process is time-consuming, in addition to there being the possibility of bias based on the coding analysis of the interviews and how the questions are phrased. As previously stated, the interviews are also only conducted through zoom audio calls, so there is less ability to insert bias but also less ability to read physical cues (Roulston, 2014).

## Data Analysis

Initial guiding questions will be asked during the semi-structured interview, and the interview will be conducted through an application (such as Zoom) with the video capabilities disabled. The audio will be recorded and transcribed word-for-word before analysis.

Emergent coding will be the primary technique to analyze the data. After transcribing the data, the remaining transcripts will be scanned and highlighted for anything important. The highlighted sections will then be clustered based on similarities, and a final look through will extract themes from the clusters. A benefit of this method is that more rich information is apparent than would be using a previously created rubric (Strauss & Corbin, 1990).



## Risk and Ethical Considerations

### Credibility

Trustworthiness will be established by clearly stating personal biases and limitations of the study. Additionally, steps will be taken to keep audit trails of data collection, providing thick descriptions of the data, in addition to comparing raw data to any conclusions drawn. Any results gathered from the research and data will be reviewed by outside sources.

### Risks

There is the possibility of privacy concerns for the participants. However, to minimize the privacy concerns, consent forms will be sent and completed before any data collection takes place. Additionally, all participants will have any identifiers automatically removed. Any information gathered will be kept on a password-protected computer.

## Limitations & Impact

### Limitations

There are a few limitations in regarding the methods of this study. The results received from the interviews have the possibility of being skewed regarding demographics. Demographics would broaden the scope of the project quite a bit. Because of the time restriction, demographics will not be a focus of this study. Additionally, sampling is conducted solely in the United States. Again, with the limited time frame, this type of sampling is the most feasible. Finally, recruitment is done over the internet, so there is less ability to convey understanding through face-to-face interaction (Dimond, et. al, 2012, p. 280). However, with the in-depth interviews, not much data would be gathered from face-to-face interaction that would greatly differ the results. As a result of this method, the results and conclusions can only be applied to those in the targeted population and are not generalizable.

The three overarching limitations of this study include time, location, and the nature of this study. As this project is being completed on a very tight schedule, there will not be as many interviews conducted to gain more insight into the experiences of librarians. A byproduct of this time constraint is also the location of the librarians being interviewed. As it might be more time consuming to contact and schedule participants in different time zones, the location scope might be more limited. Finally, being the sole researcher for this project, I am the only one able to collect and analyze the data, meaning

that the quality of the interviews will be limited by my ability to conduct them and the analysis will be limited to my interpretations, even though they are reviewed by outside experts in the subject areas.

## Delimitations

Some things might have been expected to be done in this study, but for reasons to be explained shortly were not included. This study will not include a triangulation of methods as the amount of time available to complete the study is very limited. Additionally, as stated previously, it might be expected that multiple people review and help in the analysis of the data collected. However, there will be only one researcher collecting and analyzing the data with advisors simply reviewing the final products.

## Impact

The results of this project should prove the connections between teen development and makerspace use. Further research could be made with larger sample sizes to try and further generalize. The results of this project could aid multiple groups, but the main stakeholders would include libraries, library staff, and, of course, youth. The conclusions could aid in providing reasoning and data for the implementation of makerspaces into their facilities. They could influence the way libraries see their spaces impacting their youth and could even get them to change how they provide/use their services to better serve their youth. The study could additionally impact the youth as they will be better served.

## Timetable, Resources, and Budget

This project will be conducted from March 2020-July 2020, as shown in the timeline below.

	March 2020	April 2020	May 2020	June 2020	July 2020	August 2020 – Papers due							
Finalize proposal													
Submit IRB application													
Collect study data													
Analyze study data													
Write the paper													
Submit draft to advisor													
Revise, submit final draft													

In order to successfully manage this project, drafts will be submitted periodically to an advisor throughout the study. A paper timeline, such as the one shown above, will be kept as well to refer back to as things begin, process, and are completed. A personal laptop and built-in audio recording will be used to conduct the interviews, and dedicated folders on a personal computer will be used for storage and maintenance of any documents. Online reference managers will be used to keep track of any resources. There is no need for any funding, as there will be no travel or material costs.

## Conclusions

The results from the interviews confirm the theoretical concepts discussed in literature to provide solid, practical proof and even more insights that could be pursued in future research. Each of the participants were asked the same questions, and nearly everything said in the interviews relates to one or more of the concepts discussed in the literature review. For the purposes of this study, the discussion around developmental assets will be based off of the Search Institute's "40 Developmental Assets for Adolescents (ages 12-18)" (Search Institute, 1997).

The participants were asked to describe their makerspace. As they did, they described the space and how that space allowed for certain feelings to emerge from their teen audience. For example, one of the participants was Librarian C who works in a public library on the East Coast of the United States. They explained that two walls of their makerspace are made of glass. This allows any teen walking by to look in and see what is in there or what might be going on in the room, fostering much curiosity. Additionally, this made the makerspace very transparent and therefore open and welcoming to the teens. While this sense of atmosphere is not a developmental asset itself, it allows for other assets such as "Other adult relationships" and "Community values youth" among many others; It is the first step to opening many doors. The participants also described the various materials they provide in the makerspace and how they bring things to teens that they might otherwise be unable to access (Librarian E),

allow teens to learn “technical and artisan” skills (Kim, 2019) such as sewing or coding for a 3D printer (Librarian A), or help the teens become “makers” rather than “consumers” (Peppler & Bender, 2013) by allowing teens to work with the materials themselves rather than relying on someone else (Librarian C). Each of these opens more doors to developmental assets such as “Responsibility,” “Personal power,” and “Youth as resources,” among many others.

Even though many of the developmental assets were indirectly mentioned throughout the interviews, the participants were also asked to pick out the ones they have seen in their makerspaces. The ones most mentioned by the participants were “Other adult relationships,” “Community values youth,” “Youth as resources,” “Positive peer influence,” “Responsibility,” “Planning and decision making,” and all of the assets under Positive Identity – “Personal power,” “Self-esteem,” “Sense of purpose,” “Positive view of personal future.” These assets alone are part of nearly every section in the Search Institute’s list, which provides for a very comprehensive developmental experience within the makerspace. These assets were observed by the librarians as they were able to see the transitions teens went through from when they first came into the makerspace to when they left. Many of the librarians said the teens were “hesitant,” “nervous,” and “surprised by all the stuff” in the makerspaces. When they left after a single or series of programs, they were “confident,” “fascinated,” “engaged,” “full of ideas,” and “full of passion.” These are just a few of the adjectives used to describe the teens.

Every one of the librarians talked about how one of the biggest parts of their jobs is to encourage and support their teens. Librarian A described a situation where one of the teens in the makerspace was very enthusiastic about sewing and was quite the quick

learner. This teen was able to “go from a bean bag to a pin cushion to a sock monkey to an 8ft squid” and even started bringing her own friends into the makerspace. Librarian A saw how much this teen had grown in her time at the makerspace and offered to let her teach sewing to the friend she had brought in. Librarian A explained that it’s important “to give her that encouragement to feel like she is an authority figure as well.” This teen received support from the librarian and see that her knowledge and expertise is valued not only by other authority figures but also by her peers. In a similar manner, Librarian C mentioned that their library allows many of their teens to run workshops through their makerspace, which “have actually had much more interaction with the teens in that way since going totally virtual” because of the pandemic. It is incredible to see how one action of allowing the teens to teach others or run programs themselves can have such an impact on and cover so many developmental assets.

Another concept mentioned in a few of the interviews was how inspired many of the teens are when they come into the makerspace. Librarians D, E, and F all talked about how their teens come into the makerspace with a baffling amount of ideas. Librarian D discussed how one of their teens came in wanting to start his own business, and was able to make it grow into “his own custom shoe design company.” Librarian E mentioned one teen who typically came into the library to play video games, but one day found the 3D printer in the makerspace and immediately started to work: “He just started making things on his own and they were spectacular pieces! It was unbelievable, he just learned how to use this. It wasn’t just from [a model on] Thingiverse, he was actually creating these things himself.” Librarian F mentioned that many of their teens will come up and ask for new or related programs, such as 3D printing Dungeons & Dragon pieces. Not

only are the teens actively engaging with the materials provided by the makerspace, but they also embraced the ability to work together. As previously stated, some of the teens in makerspaces were able to spread their knowledge by conducting programs, but many of the makerspace programs also allow for the teens to collaborate in a team environment. For example, Librarian E discussed how many of their teens would be in the middle of a project but would look and ask around the other teens to get insight as to what they should do next. Librarian A mentioned that during many of the more creative painting programs, the teens work together on a large table and are able to fairly smoothly interact with each other to share supplies, ideas, and space. There is also a paid internship program held through Librarian D's library and makerspace that partnered with a local print collaborative where ten teens were able to complete a steam roller printing project together. The impact of these situations is summarized very well by Librarian F when they stated "Maker programming is another way to help [the teens] empower and innovate. [It is] a way to look at the world and imagine the possibilities, and a way to try and think beyond whatever the current means are." The makerspace "gives them [teens] a place in the library" and provides a safe space where they "feel welcome" enough to express "their own hidden talents" feel like "they are part of the club" (Librarian E).

Because the makerspace provides this safe and comfortable space for teens, another developmental aspect examined during the interviews was confidence. This characteristic was presented in a few different ways based on observations from the librarians. Librarian A recounted how they would put up some of the left-behind art from programs on the walls, "so that they [the teens] could start to take pride in something,



even if it was something they didn't think was necessarily the greatest," and the teens would come back excited to see their creations on display. Librarian C discussed how there was a particularly challenging program where the teens were using a soldering iron to make light-up origami flowers:

"[At first,] they were so scared that we were letting them use this equipment...but by the end of the program the teens were so confident...They realized that no one was going to get hurt as long as they were conscious of the safety equipment and aware [of their environment]."

This confidence is also grown from another particularly difficult lesson being failure. Something that all of the participants mentioned, either directly or indirectly, was the ability the teens had to fail, re-evaluate, and try again. Librarian D talks about "failure being okay" and how "that's the place for exploration." Librarian E talks about how when they have to make an example for a program, they make it once and show it to the teens even if it is not perfectly made. The idea behind this is to learn that "the first time isn't going to be perfect, even sometimes after 5 or 10 times, and that's normal. Everyone should be proud of what they're doing, and [the teens] almost always outdo me anyway." (Librarian E).

As the previous quote conveys quite clearly, it is truly amazing to see how inspired and proud the library staff are of the teens that come into their makerspaces. The teens themselves have such an impact on the library as well, and the whole community is able to benefit from it. The teens bring in their family and friends to participate in maker programming (Librarians A, D, & F), they showcase their products to others (Librarians A & F), and they grow to actively participate in other community programs (Librarian D) among so many other things. Librarian D mentioned how much passion and drive their teens had and how "it really gives us hope for the future of the world."

If the Search Institute's assets translate to every person's personal and professional life as discussed in the literature review, then the teens that make use of their public library's makerspace will have a significant advantage in their futures. This in turn has the ability to impact the library staff, immediate community, and various people and places around the world as teens move away. Librarian C was able to express this idea of branching out by stating "When teens come into the makerspace especially for the first time, they're impressed by the things we have. But when they leave, they're impressed by the things they can do." Makerspaces are able to give teens the opportunities to succeed. However, it is up to the teens to take those opportunities and run with them, and from what can be seen in the literature and these interviews, teens have done exactly that.

While the findings from this study help prove that theoretical concepts surrounding teen development discussed in literature can be directly linked to practices in public library makerspaces, there is still a lot of research that can be done. Limitations such as time and scope did not allow for looking at a more generalized population such as world-wide makerspaces that might not necessarily be in public libraries. Future research in different areas could greatly benefit the understanding of how the environment around makerspaces could also impact youth development and how an understanding of that could lead to better community-oriented service.

## References

- Barton, A., Tan, E., & Shin, M. (2016). "Mobilities of criticality: Space-making, identity and agency in a youth-centered makerspace." *International Conference of the Learning Sciences Conference 2016*, p. 290-297.
- Barton, A., Tan, E., & Greenberg, D. (2017). "The makerspace movement: Sites of possibilities for equitable opportunities to engage underrepresented youth in STEM." *Teachers College Record*, 119.
- Dimond, J., et. al. (2012). "Qualitative data collection technologies: A comparison of instant messaging, email, and phone." *Proceedings of the 17<sup>th</sup> ACM International Conference on Supporting Group Work*, p. 277-280.
- Du, Y. (2019). "Library makerspaces and connected learning to advance rural teen creativity." *University of North Texas* (Thesis Paper).
- Edwards, O., et. al. (2007). "Developmental assets: A prevention framework for students considered at risk." *Children & Schools*, 29(3), p. 145-153.
- Feist, A. (2018). "Serving patrons experiencing homelessness in your makerspace." *PLA 2018 Conference*.
- Fourie, I., & Meyer, A. (2015). "What to make of makerspaces: Tools and DIY only or is there an interconnected information resources space?." *Library Hi Tech*, 33(4), p. 519-525.

- Gomez, A. (2019). "The effects of makerspace learning on the social interactions among students with emotional or behavioral disorder." *The University of Texas at San Antonio* (Thesis Paper).
- Grover, S., & Pea, R. (2013). "Computational thinking in K-12: A review of the state of the field." *Educational Researcher*, 42(1), p. 38-43.
- Halverson, E., Lakind, A., & Willett, R. (2017). "The Bubbler as a systemwide makerspace: A design case of how making became a core service of the public libraries." *International Journal of Designs for Learning*, 8(1), p. 57-68.
- Kim, Y., et. al. (2019). "Making culture: A national study of education makerspaces." *South By Southwest Education Conference*.
- Li, X., & Todd, R. (2019). "Makerspace opportunities and desired outcomes: Voices from young people." *Library Quarterly: Information, Community, Policy*, 89(4), p. 316-332.
- Moorefield-Lang, H. (2015). "When makerspaces go mobile: Case studies of transportable maker locations." *Library Hi Tech*, 33(4), p. 462-471.
- Neuman, S., & Celano, D. (2006). "The knowledge gap: Implications of leveling the playing field for low-income and middle-income children." *Reading Research Quarterly*, 41(2), p. 176-201.
- Peppler, K., & Bender, S. (2013). "Maker movement spreads innovation one project at a time." *The Phi Delta Kappan*, 95(3), p. 22-27.
- Pisarski, A. (2014). "Finding a place for the tween: Makerspaces and libraries." *Children and Libraries*, 12(3), p. 13-16.

- Roulston, K. (2014). "Interactional problems in research interviews." *Qualitative Research*, 14(3), p. 277-293.
- Scales, P., et. al. (2000). "Contribution of developmental assets to the prediction of thriving among adolescents." *Applied Developmental Science*, 4(1), p. 27-46.
- Scales, P., et. al. (2006). "The role of developmental assets in predicting academic achievement: A longitudinal study." *Journal of Adolescence*, 29, p. 691-708.
- Scales, P., (2011). "Youth developmental assets in global perspective: Results from international adaptations of the developmental assets profile." *Child Indicators Research*, 4(4), p. 619-645.
- Schultze, U., & Avital, M. (2011). "Designing interviews to generate rich data for information systems research." *Information and Organization*, 21(1), p. 1-16.
- Search Institute. (1997). "40 developmental assets: For adolescents (ages 12-18)." *Search Institute*.
- Sheridan, K., et. al. (2014). "Learning in the making. A comparative case study of three makerspaces." *Harvard Educational Review*, 84(4), p. 505-531.
- Stevenson, M., et. al. (2019). "By design: Professional learning ecologies to develop primary school teachers' makerspaces pedagogical capabilities." *British Journal of Educational Technology*, 50(3), p. 1260-1274.
- Strauss, A., & Corbin, J. (1990). *Basics of qualitative research*. Sage Publications.
- Wohlwend, K., & Peppler, K. (2015). "All rigor and no play is no way to improve learning." *The Phi Delta Kappan*, 96(8), p. 22-26.

## Appendix A. Interview Guide

- (1) Can you state your job title?
- (2) How long have you worked in your current position?
- (3) Have you worked in public libraries with makerspaces and teens before your current positions?
- (4) Can you describe your current [and/or past] job responsibilities?
- (5) [If answered makerspace librarian – as opposed to teen librarian – for Q1]:  
How often do you work with teens in the makerspace?  
[If answered teen librarian – as opposed to makerspace librarian – for Q1]:  
How often do you hold programs for teens in the makerspace?
- (6) Can you describe your makerspace [ex. space, furniture, technologies, etc.]?
- (7) Can you describe and give examples of teen programs you have in the makerspace?
- (8) Can you talk about how teens interact with the makerspace?
- (9) What life skills or habits of mind do you think teens develop in the makerspace?
- (10) Can you think of what developmental assets from the Search Institute's list of 40 developmental assets most align with the skills/habits you just mentioned? (give a list of 40 developmental assets model used in Lit Review to choose from)

- (11) Can you describe how you have seen teens learn from their interactions at the makerspace? If you can, give specific examples of the development area and the things interacted with [whether it be collaboration with peers, working with a 3D printer, using a sewing machine, etc.]
- (12) How have the teens expressed to you their interactions at and feelings about the makerspace?
- (13) Is there anything else you would like to share with me?
- (14) Do you have any questions for me?

## Appendix B. Recruitment Scripts

### For the library

Good [Morning, Afternoon, Evening],

My name is Gracey Gordon, and I am a student at the University of North Carolina at Chapel Hill. I am currently in the Master's program for Library Science and in the process of conducting my master's proposal project. I am studying the impacts that makerspaces have on youth development. I am looking to do interviews of public librarians who are either makerspace librarians and work with teens (ages 12-18) or are teen librarians that work in makerspaces. I was able to see that your library has a makerspace, and I was wondering if you would be willing to share my contact information with the librarian who works in your makerspace?

Regards,

Gracey Gordon



For the librarian

Good [Morning, Afternoon, Evening],

My name is Gracey Gordon, and I am a student at the University of North Carolina at Chapel Hill. I am currently in the Master's program for Library Science and in the process of conducting my master's proposal project. I am studying the impacts that makerspaces have on youth development. I am looking to do interviews of public librarians who are either makerspace librarians and work with teens (ages 12-18) or are teen librarians that work in makerspaces. I was able to find your contact information on your library website. Would you be willing to participate in my interview process and answer some questions about how you perceive makerspaces impacting teens and certain developmental assets?

Regards,

Gracey Gordon

## Appendix C. Consent Form

**University of North Carolina at Chapel Hill**

**Research Information Sheet**

**IRB Study #:** 20-1519

**Principal Investigator:** Graceon Gordon

The purpose of this research study is to see the impact makerspaces have on teen developmental assets by looking at the perceptions and experiences of public librarians that work with teens and makerspaces. Additionally, this study will bridge the knowledge gap between teen development and the impact of makerspaces by stating how research defines and connects the two areas. You are being asked to take part in a research study because you are a public librarian who is either a makerspace librarian that works with teens or are a teen services librarian that works in makerspaces.

Being in a research study is completely voluntary. You can choose not to be in this research study. You can also say yes now and change your mind later.

If you agree to take part in this research, you will simply be asked to answer some interview questions regarding your experience with teens and makerspaces. Your

participation in this study will take about thirty minutes to one hour for the duration of the interview. We expect that five to six librarians will take part in this research study.

You can choose not to answer any question you do not wish to answer. You can also choose to stop taking the interview at any time. You must be at least 18 years old to participate. If you are younger than 18 years old, please stop now.

The possible risks to you in taking part in this research are:

- Information privacy  
The possible benefits to you for taking part in this research are:
- Participation in a study that helps prove the connections between teen development and makerspace use.
- Conclusions from this study can help you provide greater reasoning for the implementation of makerspaces and materials into your facilities.
- Analysis from this study can positively influence the way you and other librarians see their makerspaces impacting your youth and possibly change how you provide/use your services to better serve your youth.

To protect your identity as a research subject, all participant identifiers will be automatically removed during data collection of interviews. All information will be kept on a password protected computer.

If you have any questions about this research, please contact the Investigator named at the top of this form by calling or emailing [gordong@live.unc.edu](mailto:gordong@live.unc.edu). If you have questions or concerns about your rights as a research subject, you may contact my faculty advisor, Dr. Brian Sturm by phone at 919-962-2460 or by email to [sturm@ils.unc.edu](mailto:sturm@ils.unc.edu), or you may

contact the UNC Institutional Review Board at 919-966-3113 or by email to

[IRB\\_subjects@unc.edu](mailto:IRB_subjects@unc.edu).